

3726



**TRANSMITTAL LETTER  
(General - Patent Pending)**

Docket No.  
243115-3 (P5742)

In Re Application Of  
**Blacket**

Serial No.  
09/509,302

Filing Date  
6/2/2000

Examiner  
**J. Cozart**

Group Art Unit  
3726

Title: **SHEET JOINING METHOD AND APPARATUS AND A RIVET FOR USE IN THE METHOD**

**TO THE COMMISSIONER FOR PATENTS:**

Transmitted herewith is:

**One-Month Petition for Extension of Time  
Amendment**

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in the above identified application.

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Signature

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Dated: 6/24/03

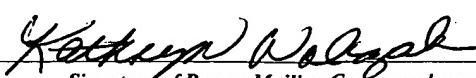
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PATENT TRADEMARK OFFICE

CC:

  
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Typed or Printed Name of Person Mailing Correspondence



PATENT ATTORNEY DOCKET P5742

10/14  
Peggy Rice  
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7-9-03

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicants: Blacket )  
                       )  
Serial No.: 09/509,302 )      Examiner: J. Cozart  
                       )  
Filed: June 2, 2000 )      Group Art Unit: 3726  
                       )  
For: SHEET JOINING METHOD )  
AND APPARATUS AND A RIVET )  
FOR USE IN THE METHOD )  
                       )

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AMENDMENT

Dear Sir:

This is in response to the Office Action dated February 26, 2003.

**REMARKS**

The Examiner has rejected Claims 2-12, 15 and 17-22 under 35 U.S.C. 103 (a) as being unpatentable over German Patent No. 4,419,065 (the '065 German patent) in view of U.S. Patent No. 5,051,020 issued to Schleicher (the Schleicher patent).

The present invention relates to increasing the shear load strength of a sheet metal joint by forming a dimple around that joint. The key to the invention is to deform all of the sheets out of their planes and into an annular recess immediately adjacent to the die cavity. This deformation provides a "dimple" around the joint that improves its strength. As indicated in the

introductory part of the specification of the present application, the technique is particularly suited to thin sheet material where failure under shear load generally occurs by a rivet tilting and pulling out of the joint. The thin sheets also have a tendency, under shear load, to curl away from one another. The addition of the dimple has the effect of stiffening the material to prevent curling and rivet tilting. The dimple provides a degree of mechanical interlock at the facing surfaces of the two sheets that assists in improving the strength of the joint.

The '065 German patent fails to illustrate a fastener setting and deforming assembly with an annular recess immediately adjacent to the cavity as recited by independent Claims 17 and 22. The Examiner asserts that Fig. 1A of the '065 German patent illustrates an annular recess that is immediately adjacent to the cavity (10). Figure 1A of the '065 German patent, however, illustrates a die cavity 10 with a raised central area that encourages flaring of the rivet. As shown in Figures 1B and 1C, the periphery of the die has a raised cutting edge 12 that embeds into the thick sheet 2 of material. The raised cutting edge 12 around the die cavity 10 separates what the Examiner considers as the annular recess of the die from the die cavity 10. As a result, the die annular recess is not immediately adjacent to the center cavity such that there is nothing between the annular recess and the cavity. Instead, in the '065 German patent, the annular recess is immediately adjacent to the raised cutting edge 12 of the die, not the die cavity.

The Schleicher patent also does not disclose deformation of the sheets into an annular recess immediately adjacent to the die cavity. In contrast, the sheet material in the Schleicher patent is simply squeezed by a projecting coining ring. The sheets remain undeformed in the region radially outboard of the coining ring. There is no disclosure of deforming the sheets in the manner envisaged by the present invention.

Additionally, in the rejection, the Examiner has acknowledged that the '065 German patent does not explicitly disclose deforming both of the sheets out of their planes into the annular recess. The top sheet of the '065 German patent is not distorted in the region immediately outside the die cavity and the bottom sheet is simply pierced by an edge of the die. The Examiner has asserted, however, that the Schleicher patent discloses a die wherein each metal sheet is deformed out of a plane into an annular recess surrounding a cavity in order to effectively form a clinch type leak proof joint. Applicants respectfully traverse the Examiner in this regard.

The Schleicher patent illustrates a leak-proof clinch type joint formed with sheets that are simply squeezed together in the region around the die cavity. The sheets are squeezed together by complimentary dies and the use of a punch 296 with a flat free end 300 and a coining ring 290 that surrounds the die cavity 292 (see Figure 31). Although each sheet is compressed by the complementary dies, the sheets still occupy the same plane in the region around and adjacent to the die cavity. In fact, there is no mechanical interlock between the sheets at their interfacing surfaces in the region around the die cavity. Thus, the Schleicher patent also fails to disclose deformation of both sheets into an annular recess immediately adjacent to the die cavity.

Thus, the combination of the '065 German patent and the Schleicher patent fails to illustrate the present invention as set forth in independent Claims 17 and 22 and dependent Claims 2-12, 15 and 18-21.

The Examiner has combined the teaching of the '065 German patent with the teaching of the Schleicher patent asserting that it would have been obvious to provide the apparatus of the

'065 German patent with the complementary dies of the Schleicher patent to arrive at the present invention. As discussed above, even when combined, the '065 German patent and the Schleicher patent fail to illustrate the key concepts of the present invention. In fact, the teachings of the '065 German patent and the Schleicher patent teach away from the key concept of the present invention. Both the '065 German patent and the Schleicher patent illustrate a die cavity with a structural element adjacent to the die cavity. Instead of an annular recess, in the '065 German patent, a cutting edge 12 is immediately adjacent to the die cavity and, in the Schleicher patent, a flat annular surface is positioned immediately adjacent to the die cavity.

Furthermore, a person of ordinary skill in the art would not find it obvious to combine the teachings of the '065 German patent and the Schleicher patent as suggested by the Examiner. The '065 German patent illustrates joining two planar sheets with a fastener. In contrast, the Schleicher patent illustrates forming a leak proof clinch joint by overlapping sheets and using a punch and complimentary dies to form nested cup-shaped cavities by deforming the overlapping sheets. A person of ordinary skill in the art would not use the complimentary dies of the Schleicher patent to join the planar sheets of the '065 German patent because the upper surface of the top planar sheet of the '065 German patent cannot deform in the area adjacent to the fastener to ensure that the fastener maintains the secure connection of the planar sheets.

Additionally, the technique of compressing the sheets to reduce the thickness of the sheet material as taught by the Schleicher patent would not be an appropriate technique to accomplish joining the sheets of the present invention because the present invention is concerned with the protecting sheet material that is already thin such that it could fail under a shear load.

As such, Applicant submits that independent Claims 17 and 22 are patentable over the '065 German patent in view of the Schleicher patent. As a result, Applicant also submits that dependent Claims 2-12 and 18-21, which depend from Claim 17, are also patentable over the '065 German patent in view of the Schleicher patent.

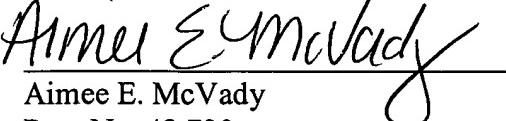
The Examiner has rejected Claim 13 under 35 U.S.C. 103(a) as being unpatentable over the '065 German patent combined with the Schleicher patent further in view of Applicant's admitted prior art. As set forth above, Applicant submits that the '065 German patent and the Schleicher patent fail to illustrate a sheet deforming assembly with an annular recess immediately adjacent to the die cavity where the assembly deforms the sheets out of their planes into the annular recess. Additionally, Applicant asserts that "Applicant's admitted prior art" also fails to illustrate a fastener setting and deforming assembly with an annular recess immediately adjacent to the cavity of the die where the planar sheets are deformed out of their planes into the annular recess.

Accordingly, Applicant respectfully submits that '065 German patent combined with the Schleicher patent and Applicant's admitted prior art, either alone or in combination, fail to disclose the key features of the present invention. Therefore, Applicant submits that dependent Claims 13 is patentable over the '065 German patent combined with the Schleicher patent in view of Applicant's admitted prior art.

In view of the foregoing amendments and remarks, it is believed that the application is now in condition for allowance and such action is respectfully requested. If the Examiner

believes that a telephone conference would advance the prosecution of this case, it is requested  
that the undersigned attorney be contacted for that purpose.

Respectfully submitted,

  
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